Region One
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Ref: JS051-12
May 15, 2012

Ladies and Gentlemen:

Fish, Wildlife & Parks (FWP), Region One, has prepared the enclosed draft environmental assessment (EA) for the purpose of continuing an experimental removal of lake trout in Swan Lake, Montana. The proposed action would involve contracting with professional fishery consultants to conduct gillnetting over a 3-week period beginning late August or early September 2012. Additionally, FWP and Swan Valley Bull Trout Working Group personnel will remove spawning adult lake trout during the months of October and November by gillnetting along known lake trout spawning sites. These activities would be conducted annually for five years.

The draft is out for a 30-day public review through June 15, 2012. Please direct your questions or comments to Fisheries Biologist Leo Rosenthal, FWP, 490 North Meridian Road, Kalispell, MT 59901, (406) 751-4548 or e-mail to lrosenthal@mt.gov.

Sincerely,

James R. Satterfield, Jr.

James R. Satterfield Jr., Ph.D.
Regional Supervisor

/ni
Enclosure
c: *Governor's Office, Attn: Mike Volesky, PO Box 200801, Helena, MT 59620-0801
*Environmental Quality Council, Capitol Building, Helena, MT 59620-1704
*Dept. of Environmental Quality, Planning, Prevention & Assistance, PO Box 200901, Helena, MT 59620-0901
*Dept. of Environmental Quality, Permitting Compliance, PO Box 200901, Helena, MT 59620
*Montana Fish, Wildlife & Parks: Director's Office, Legal Unit, & Fisheries
*MT Historical Society, State Historic Preservation Office, 225 North Roberts, Veteran's Memorial Bldg., Helena, MT 59620
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*Wayne Hirst, Montana State Parks Foundation, PO Box 728, Libby, MT 59923
*Joe Gutkoski, President, Montana River Action Network, 304 N 18th, Bozeman, MT 59715
*Senators Shannon Augare, Carmine Mowbray, & Verdell Jackson
*Representatives Joe Read, Janna Taylor, Daniel Salomon, Scott Reichner, & Mark Blasdel
Lake County Commissioners, 106 Fourth Avenue E, Polson, MT 59860
Flathead County Commissioners, 800 S Main Street, Kalispell, MT 59901
Interested parties

*E-mailed

Draft Environmental Assessment
for an Extension of
Experimental Lake Trout Removal Efforts
in
Swan Lake, Montana

May 15, 2012

Montana Fish, Wildlife & Parks

Environmental Assessment for an Extension of Experimental Removal Efforts on Lake Trout in Swan Lake, Montana

Proposed Action: Montana Fish, Wildlife & Parks (FWP) proposes to continue an experimental removal of lake trout in Swan Lake, Montana. In 2009 FWP approved a three-year experimental removal project as a feasibility study to determine if gill nets can effectively reduce the number of nonnative lake trout to improve conditions for bull trout and kokanee. While much has been learned with regard to our ability to affect lake trout cohort strength from one year to the next, the overall effect this level of removal has on the lake trout population remains unknown. The proposed action would involve contracting with professional fishery consultants to conduct gillnetting over a three-week period beginning late August or early September 2012. Additionally, FWP and Swan Valley Bull Trout Working Group (SVBTWG) personnel will remove spawning adult lake trout during the months of October and November by gillnetting along known lake trout spawning sites. These activities would be conducted annually for five years. This period of time was chosen because it represents the shortest amount of time necessary to fully assess and realize the effects of previous removal efforts. Information obtained from the proposed action will help to determine feasibility and effectiveness of alternatives for managing the lake trout population (e.g., suppression of the population). All lake trout sampled during the project will be culled; those salvageable and of suitable size for consumption will be field dressed and donated to food banks or other facilities.

Lead Agency:
Montana Fish, Wildlife & Parks

Responsible Official:
Jim Satterfield, Regional Supervisor
Montana Fish, Wildlife & Parks
Region 1
490 North Meridian Road
Kalispell, MT 59901
406-752-5501

Comment Period:
The public comment period will be through June 15, 2012. Comments may be e-mailed to lrosenthal@mt.gov or written comments may be sent to the following address:

Leo Rosenthal, Fisheries Biologist
FWP, Region 1
490 North Meridian Road
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406-751-4548

1.0 Purpose of and Need for Action

A. Proposed Action

Montana Fish, Wildlife & Parks (FWP), and the Swan Valley Bull Trout Working Group (SVBTWG) [US Fish and Wildlife Service (USFWS), US Forest Service (USFS), Montana State University Cooperative Fisheries Research Unit (MSU), Montana Trout Unlimited, Confederated Salish and Kootenai Tribes (CSKT), and the Montana Department of Natural Resources and Conservation (DNRC)] propose to extend the removal efforts for nonnative lake trout *Salvelinus namaycush* in Swan Lake, Montana, to minimize their impact on other fisheries. The goal of this lake trout population control experiment is to assess the efficacy of management actions to reduce the density of lake trout to a point in which rapid population expansion is not occurring and negative effects on populations of kokanee and bull trout are minimized. This extension of the removal experiment will continue for a period of five years. Consistent with the previous three-year project, the removal will involve using a variety of equipment over varied time periods to remove as many lake trout as possible, while minimizing mortality of nontarget species. Gill nets will be the predominant gear deployed, although the mesh size and timing of deployment will vary in relation to the age class of lake trout targeted. Due to the numbers of fish to be handled and to remain consistent with previous efforts, we propose to utilize the skills, equipment, and expertise of professional fishery consultants. The previous lake trout removal efforts resulted in 5,000 to 10,000 lake trout being removed annually. The proposed extension will likely result in similar numbers of lake trout being removed annually.

1. Funding

Contracts for the project are anticipated to cost approximately $90,000-$100,000 annually. Funding will be through a partnership between FWP and the SVBTWG. Funding for the previous three-year removal effort was a collaborative approach through the SVBTWG as well.

2. Estimated Time Line

The proposed project is an extension of the previous lake trout removal effort. Therefore timing will be similar to the previous study. The first portion of the project is anticipated to begin in late August or early September 2012 and continue for a three-week period. This first effort will largely be focused on removal of subadult lake trout and will involve the use of professional fisheries consultants. Netting activities will resume in late September/early October and will continue throughout the lake trout spawning period (early November). This later effort will be aimed at removal of the adult spawning lake trout population and will be accomplished largely by SVBTWG personnel and the chartered use of a specialized netting vessel. This same time line will be used for all five years of the proposed project. As more is learned about the lake trout population in Swan Lake, other techniques may be used to target lake trout during other times of the year.

B. Location

Swan Lake (3,239 acres) is located in the Swan River Valley of northwest Montana. The Swan River is a major tributary to Flathead Lake. Swan Lake historically contained one of the strongest bull trout populations in the entire Columbia River Basin.

C. Authority

Section 87-1-201 (1) of the Montana Code Annotated (MCA) requires Fish, Wildlife & Parks to supervise all wildlife and fish in the state of Montana. The Department may spend money for the protection, preservation, management, and propagation of fish (Section 87-1-201(3), MCA). Montana law requires the department to implement programs that manage species listed as threatened or endangered under the federal Endangered Species Act in a manner that assists in the maintenance or recovery of those species (Section 87-1-201(9), MCA).

D. Need for the Action

The Swan Valley has historically been home to a stable, healthy bull trout population and a recreationally important kokanee salmon fishery. In 1998, bull trout were classified as threatened under the federal Endangered Species Act. Coincidentally, in 1998, anglers began to occasionally catch adult-sized (20-30-inch) lake trout from Swan Lake and the Swan River. This caused alarm because lake trout are not native and are notorious for rapidly expanding and dominating fish communities in lakes at the expense of bull trout and kokanee salmon. Lake trout are an unauthorized introduction into Swan Lake, either through negotiating the fish ladder over Bigfork Dam from Flathead Lake or as a result of an illegal introduction. In 2003, the level of concern was compounded when biologists gillnetted a 9-inch juvenile lake trout from Swan Lake during standard low-intensity sampling efforts, indicating that wild reproduction was occurring. A similar survey in 2004 captured 7 more juvenile lake trout. In 2005, biologists captured 28 juvenile lake trout, mostly 9-12 inches long.

In 2006, MSU conducted a six-week series of gill net surveys on Swan Lake, from mid-September through the last week of October 2006. Single mesh 250-foot gill nets, with 1" bar mesh size (2" stretch) were deployed throughout the lake in order to gather some baseline data and attempt to capture adult lake trout for sonic tag implants to track fish movements. During the six-week period, 28 such net sets resulted in capture of 110 bull trout and 194 lake trout.

During 2007, an effort was made to estimate the population of lake trout in Swan Lake using mark-recapture techniques. Although over 2,000 lake trout were netted, with 1,400 marked and released, the resulting population estimate was questionable due to the low number of recaptured lake trout observed. Many possible reasons exist for the low recapture rate of lake trout, including changes in behavior of marked fish and mortality in marked fish. Because confidence in the 2007 estimate was low among SVBTWG biologists, a depletion population estimate was conducted in the fall of 2008. This methodology involved a similar gillnetting effort to that of 2007, but relied on removal of lake trout to obtain a depletion rate rather than the mark-recapture method used in 2007. A total of 3,487 lake trout were removed over the three-week period and resulted in a population estimate of about 8,800 (95% CI: 7,300-10,500) lake trout between 6.5" and 35.4".

In 2009 FWP released an EA for a three-year experimental removal of lake trout in Swan Lake. This removal experiment was essentially a feasibility study to determine the effectiveness of using targeted gillnetting as a technique to reduce the number of lake trout, and thus minimize threats of an increasing lake trout population to kokanee and bull trout. From 2009-2011 over 20,000 lake trout were removed from Swan Lake. Total annual mortality rates for lake trout vulnerable to the nets used in the project were higher than literature suggests are sustainable. A complete analysis of the results from this project can be found in the summary report for the

three-year experimental removal (Rosenthal et al. 2012). While much has been learned with regard to our ability to affect lake trout cohort strength from one year to the next, the overall effect this level of removal has on the lake trout population and other fish populations remains unknown.

The deployment of gill nets on a large scale has proven effective in capturing large numbers of lake trout for similar research efforts in the Great Lakes area and most recently (2005-2011) in northern Idaho (Lake Pend Oreille and Upper Priest Lake), in Yellowstone Lake (1994-2011), and in Swan Lake (2007-2011). Because existing equipment (state, federal, and Tribal) is inadequate to efficiently handle large numbers of fish, professional fishery consultants have been required for these efforts.

Understanding the impacts of this recently established population of lake trout, and developing methods of managing the population, requires considerable information with regard to population size, population demographics (growth rate, fecundity, etc.) and life history. Research efforts since 2007 accomplished these tasks, and the proposed action represents a continuation in the next step of evaluating the feasibility of controlling this species. The proposed extension of the removal effort will continue to reduce the number of lake trout, thus minimizing their impact on other fish species, and will allow biologists to fully realize the overall effect of the past years of suppression. This continued evaluation (based on specific criteria) of the success of this action will help guide decisions on any future suppression of lake trout in Swan Lake.

Swan Lake represents a unique learning opportunity with regard to lake trout suppression. Similar removal efforts have been, and continue to be, conducted in other waters with as yet no definitive success. Swan Lake differs from other examples because of the early stage of lake trout establishment, the relatively small size and simple bathymetry of the lake, and the lack of an established sport fishery for lake trout. Additionally, thorough baseline data regarding the local fish assemblage has been collected prior to lake trout establishment and will allow scientists to determine if our actions have been effective.

E. Objectives of the Action

The primary objectives of the proposed action are to halt expansion of the lake trout population in Swan Lake, cause a downward trajectory in the future growth of the lake trout population, and elicit a positive response in the bull trout and kokanee salmon populations. Based on similar examples in Montana and surrounding states, and our collective scientific judgment based on known facts, the unchecked expansion of lake trout in Swan Lake will lead to collapse of the kokanee salmon fishery and a depressed bull trout (a federally listed species under the Endangered Species Act) population. The proposed extension of the removal effort will provide information to scientists on the feasibility of a suppression program. The knowledge gained will help direct future management of Swan Lake.

F. Relevant Plans, EAs, and Other Documents

- Hazardous Analysis and Critical Control Point (HACCP) Plan for the 2007 and 2008 Swan Lake netting effort: In 2007 and 2008, an HACCP plan was developed for deploying the professional gillnetting vessel from Idaho into Swan Lake. This plan identifies and addresses

potential pathways to prevent the movement and spread of Aquatic Invasive Species (AIS) such as zebra mussels and Eurasian milfoil on equipment moved in from other basins.

- 2007 Benefit/Risk Analyses for the Swan Lake Trap Net and Gill Net Survey: The USFWS and FWP developed a benefit-risk analysis in 2007 to determine the risks to bull trout. This document proved valuable for estimating the impact of netting operations on bull trout. Bycatch of nontarget species and associated bull trout mortality was lower than expected during all research efforts since 2007.
- Environmental Assessment (EA) for Conducting a Depletion Population Estimate for Lake Trout in Swan Lake, Montana: FWP prepared an EA for the work completed in 2008. The EA was released for public comment for a period of 30 days, and a public meeting was held to explain the methods involved in conducting a depletion population estimate. Overall, 12 comments were received, with no comments in opposition to the project.
- EA for an Experimental Removal of Lake Trout in Swan Lake, Montana: FWP prepared an EA for the work completed from 2009-2011. The EA was released for public comment for a period of 30 days, and a public meeting was held to explain the methods involved in an experimental lake trout removal project. Overall, 29 comments were received by mail, email, and in person. The majority of comments (22) either supported the project or suggested alternative thoughts, while seven individuals commented against the project.
- 2009 Request for Proposals (RFP) for professional fisheries consultants: An RFP was developed concurrently with the previous (2009) environmental assessment. This document requests proposals from contractors to conduct the gill netting described in the 2009 EA.
- Experimental Removal of Lake Trout in Swan Lake, Montana: 3-year Summary Report: This report was prepared by FWP, USFWS, and MSU for the SVBTWG. The report provides a summary of the 2009-2011 experimental removal project. The report provides all gill net catch data, an analysis of the potential bycatch impacts to bull trout, and an examination of the evaluation criteria identified in the 2009 EA.

G. Decisions to be Made

The Decision Maker will determine the following from this EA:

- Determine if proposed alternatives meet the project objectives.
- Determine which proposed alternative should be selected.
- Determine if the selected alternative would cause significant effects to the human environment, requiring the preparation of an environmental impact statement (EIS).

H. Scope and History of this Environmental Analysis

The Swan drainage contains one of Montana's most stable and healthy bull trout populations, as well as important fisheries for kokanee and northern pike. However, in 1998 anglers began catching and reporting adult-sized (20-30-inch) lake trout from Swan Lake and the Swan River upstream of the lake. It is suspected lake trout either ascended the Bigfork Dam fish ladder prior to closure in 1993, or they were illegally introduced into Swan Lake. In 2003 FWP gillnetted a 9-inch juvenile lake trout from Swan Lake during annual monitoring efforts, providing the first evidence of lake trout reproduction in the Swan system, and these numbers have continued to grow. These data led biologists to conclude that lake trout establishment is a growing threat to the bull trout populations in Swan Lake, the Swan River system, and inter-connected Lindbergh and Holland Lakes upstream.

These findings served as a catalyst in the formation of the SVBTWG in 2004. The SVBTWG is composed of five government agencies (FWP, USFWS, CSKT, DNRC, and USFS), MSU, and Montana Trout Unlimited. The SVBTWG determined that, if left unchecked, it is a matter of time until lake trout will become the dominant fish predator in the Swan ecosystem. The SVBTWG was formalized by an MOU in 2005 and since its inception has made efforts toward evaluating and assessing the lake trout threat.

In the years since discovery of the first lake trout in the Swan drainage, FWP has increased annual spring and fall gill net sampling to increase information about lake trout population structure and distribution. Each year since 2003, fall sampling captured an increasing number of juvenile lake trout. In 2005, biologists netted 28 juvenile lake trout 9-12 inches long. No adult lake trout were captured in gill net sets prior to 2006. This information, along with the capture of very few lake trout as reported by anglers in 2005 or 2006, suggested that populations of adult or subadult lake trout in Swan Lake were low.

Considerable efforts were made to learn more about the newly established lake trout status in Swan Lake. Analysis of these results led the SVBTWG to conclude that more focused research efforts were needed to better characterize the lake trout population status and structure. FWP supported a graduate student project on Swan Lake, using Bonneville Power Administration (BPA) funding as a partial source of support. A plan of work was developed, and in August 2006, an MSU graduate student was selected to conduct the research effort. Objectives of the study were to: 1) identify the timing and location of lake trout spawning areas, 2) evaluate alternative gear types as methods of sampling lake trout, 3) estimate the population density and structure of lake trout in Swan Lake, and 4) model various harvest scenarios to estimate effort needed to negatively impact growth of the lake trout population (Cox 2010).

MSU conducted a six-week series of gill net surveys on Swan Lake, from mid-September through the last week of October 2006. Single mesh 250-foot gill nets, with 1" bar mesh size (2" stretch), were deployed throughout the lake basin to gather baseline data and attempt to capture adult lake trout for sonic tag implants. During the six-week period, 28 such net sets resulted in capture of 110 bull trout and 194 lake trout. Bycatch of other species was not accurately monitored, but consisted of about 150 mountain whitefish and several hundred cyprinids (mostly peamouth and northern pikeminnow) and suckers. Only one adult lake trout was captured alive, sonic tagged, and released. PIT (Passive Integrated Transponder) tags were implanted into 101 sub-adult lake trout that were subsequently released.

The high catch of small lake trout in the fall 2006 gill net surveys greatly increased the concern of the SVBTWG about the rapidly expanding lake trout population and led to discussions about how to improve capabilities of the research effort. Simultaneously, USFWS was able to secure funding of approximately $40,000 to support an effort to develop a lake-wide population estimate of lake trout. The USFWS contracted with professional fisheries consultants to build and deploy deepwater trap nets and gill nets in Swan Lake in the fall of 2007, with the goal of establishing a lakewide lake trout population estimate.

The fall 2007 fish sampling took place over a three-week period from September 17-October 4. Short-set gill nets were used to capture live fish for marking and release. Most nets were set in water 80 feet or deeper. The goal of the sampling was to release as many tagged live lake trout as possible, so that a mark-and-recapture population estimate could be achieved. Biologists set a

total of 26.5 miles of gill net at various locations around Swan Lake. The nets were checked about every two hours during morning and evening. In addition to gill nets, two deepwater trap nets were set, but caught relatively few fish. The total catch included 2,156 lake trout. Of these, 735 were mortalities, 30 were sonic-tagged, and 1,391 received PIT tags and were released to aid in population estimates.

Although over 2,000 lake trout were sampled during the 2007 effort, the validity of the population estimate was questioned because of inadequate rates of recapture. Many possible reasons exist for not obtaining a more reliable population estimate, including changes in behavior of marked fish and mortality in marked fish. Because of this uncertainty, a population estimate was obtained using depletion methodology in 2008. Netting was again contracted with fisheries consultants and conducted during the period from September 9-23. Different than in 2007, all lake trout captured during the three-week period were removed from the system, and the reduction in catch rate was used to obtain the population estimate. A total of 3,487 lake trout were removed over the three-week period, and resulted in a population estimate of about 8,800 (95% CI: 7,300-10,500) lake trout between 6.5" and 35.4". Concomitant with the population estimate, sonic-tag-implanted lake trout were tracked during the spawning months (October-November), and accurate locations of spawning concentrations were identified. Gill nets set at the spawning locations resulted in an additional 70 adult lake trout captured and provided evidence that netting during this time period could be a useful method in targeting the adult component of the lake trout population.

In 2009 FWP released an EA for a three-year experimental removal of lake trout in Swan Lake. This removal experiment was essentially a feasibility study to determine the effectiveness of using targeted gillnetting as a technique to reduce the number of lake trout, and thus minimize threats of an increasing lake trout population to other fish species. The removal effort was comprised of two distinct netting events. The first portion of the effort (Juvenile Netting) was aimed at removing juvenile and subadult lake trout, thereby reducing competition and predation on the kokanee and bull trout populations. The second netting event (Spawner Netting) is aimed at the removal of adult lake trout and thus directly affecting further recruitment of the lake trout population. From 2009-2011 over 20,000 lake trout were removed from Swan Lake. A complete analysis of the results from this project can be found in the summary report for the three-year experimental removal effort (Rosenthal et al. 2012). While much has been learned with regard to our ability to affect lake trout cohort strength from one year to the next, the overall effect this level of removal has on the lake trout population and subsequent benefits to other fish species remain unknown.

An extension of the previous three years of work will continue to reduce the overall number of lake trout in Swan Lake and will allow scientists to more thoroughly evaluate the effectiveness of the previous work. Measurable goals and specific success criteria identified in the 2009 EA (see page 13 for criteria) will be used to evaluate the feasibility and effectiveness of alternatives to control expansion of the lake trout population. Based on the results of this assessment and other pertinent information, FWP, with recommendations from the SVBTWG, will consider whether these actions are appropriate or if other changes are warranted in fisheries management of Swan Lake and the lake trout population.

I. Issues Studied in Detail

1. Fish Species (Issue 1)

An extension of removal efforts on lake trout in Swan Lake is expected to continue to reduce the existing number of lake trout and cause a downward trajectory in future growth of the population. At this time, fishery scientists from FWP and the partner agencies are in agreement that, left unchecked, the observed rate of lake trout expansion cannot be sustained with existing food resources in Swan Lake. Cascading subsequent effects such as probable collapse of introduced kokanee and depression of native bull trout populations are considered likely. Removing or not removing lake trout from Swan Lake is expected to cause changes in the diversity and abundance of other game and nongame fish species, as well as other aquatic organisms. Netting activities directed at the developing lake trout population will have direct impacts on bull trout, a Threatened Species under the Endangered Species Act, and other fish communities in the lake through bycatch mortality.

2. Threatened and Endangered Species (Issue 2)

Many examples in the West have demonstrated that introduced lake trout negatively impact native bull trout populations. These impacts stem from competition and direct predation. If lake trout are left unchecked, the Swan Lake bull trout population will likely decline. Bull trout will likely lose or severely reduce their adfluvial migratory life history in the basin, resulting in smaller sizes of adult bull trout. This may further aggravate an existing problem of hybridization and competition with brook trout occurring in many of the bull trout spawning and rearing tributaries. Conducting gillnetting to suppress the lake trout population will have unintended impacts to the bull trout population through bycatch-related mortality. Mortality associated with the bycatch of bull trout will be minimized by strictly controlling the timing, depth, and location of net sets and rapid removal and resuscitation of all live bull trout inadvertently captured in the nets, as it was during all research efforts since 2007. A portion of the bull trout captured will be dead, and these fish will be retained and used for additional research objectives as allowed under existing permitting.

3. Sensitive Species (Issue 3)

Westslope Cutthroat Trout

Westslope cutthroat trout are in low abundance in Swan Lake. Based on experience in nearby Flathead Lake, lake trout will further reduce cutthroat abundance through predation. Netting to reduce abundance of lake trout is unlikely to result in mortality of westslope cutthroat trout, based on the depth and location of net sets. Research efforts since 2007 have never captured cutthroat trout.

4. Public Controversy (Issue 4)

The expanding presence of lake trout in Swan Lake has generated substantial concern among fisheries professionals and the public. The proposed actions may cause public controversy. Some groups may argue against removing lake trout; however, others will argue for removal/control of the species to maintain the native and recreational fisheries present in Swan Lake.

J. Issues Eliminated from Further Study

1. Community and Economic Impact

Lake trout impacts to Swan Lake fisheries are likely, but the specifics are unknown. Initially, a robust lake trout population, with trophy-sized fish produced as a result of fast growth and abundant kokanee forage, would likely be attractive to anglers. However, in many similar situations, after a large lake trout population becomes established, it will likely reduce or eliminate kokanee salmon and impact bull trout populations. The resulting fishery is likely to become similar to those found in nearby Whitefish Lake, where the large lake trout rapidly disappear from the population. This may change angler use of Swan Lake and indirectly cause economic changes in the community. However, the established lake trout population may offset changes in angler use related to declines in bull trout and kokanee salmon fisheries, at least so long as a lake trout population with diverse size classes is maintained. The proposed extension of removal efforts will reduce the lake trout population, thus delaying changes in other fisheries, but the effect on lake trout will likely be short term. Long-term solutions to issues related to community impacts of lake trout on fishing opportunities and fishing economics will require continued evaluation.

2. Effects on Other Wildlife

Conducting netting activities on a water body may temporarily change behavior of some wildlife species (e.g., bald eagles); however, no negative consequences are anticipated for conducting such activities. Occasionally, fish-eating birds are captured in gill nets, but in this situation the nets will be fished in 70-foot and deeper waters where the likelihood of catching such species is very unlikely. To date, no birds or mammals have been captured in nets during research activities.

K. Applicable Permits, Licenses, and Other Consultation Requirements

1. Permits

Any alternative selected that requires handling of fish will require consultation with the USFWS to determine relative impacts to bull trout, a Threatened Species under the Endangered Species Act. At the conclusion of this evaluation, the USFWS will incorporate any additional bull trout incidental take under the existing Section 6 permit authorized by the Endangered Species Act.

2. Consultation Requirements

Any alternative selected that requires bringing in a fishing boat from out of state will require consultation with FWP's Aquatic Invasive Species Coordinator. Through this consultation a Hazardous Analysis and Critical Control Point (HACCP) plan will be developed to prevent the introduction and spread of Aquatic Invasive Species (e.g., zebra mussels, New Zealand mudsnails, and vegetation).

L. Why an EA is Appropriate Level of Review

Based on an evaluation of impacts to the physical and human environment under MEPA, this environmental review revealed only one noteworthy potential negative impact (public controversy) that could not be mitigated from the proposed action. Removing fish species from a water body is not a new or unusual FWP action, it will not set a precedent, and it will not conflict with local, state, or federal laws or formal plans. Due to these factors, an EIS is not necessary and an EA is the appropriate level of analysis. A narrative EA was performed because this action

may generate public controversy, the action has potentially noteworthy impacts that can be mitigated, and FWP encourages public involvement through the entire decision-making process.

2.0 Alternatives Including the Proposed Action

A. Introduction

The purpose of Chapter 2 is to describe and compare the alternatives by summarizing the environmental consequences. This chapter describes the activities of the no-action alternative and all action alternatives. However, information that is more detailed can be found in Chapters 3 and 4. This chapter presents the predicted attainment of project objectives and the predicted effects of all alternatives on the quality of the human environment in comparative form, providing a basis for choice among the options for the Decision Maker and the public.

FWP and partners have developed two possible alternatives. The alternatives are 1) the no-action alternative and 2) an extension of the multifaceted removal approach targeting both juvenile/subadult and adult lake trout.

B. Description of Alternatives

1. Alternative A: No-Action Alternative

a. Principal Actions of Alternative A

Under Alternative A, the no-action alternative, no additional lake trout would be removed from Swan Lake other than those taken by anglers. The number of lake trout in Swan Lake would not be reduced, and the population would likely continue to increase. Under this alternative, FWP will continue annual monitoring of the fish community in Swan Lake. This monitoring will provide relative abundance information that can be used to detect trends in fish populations through time. However, trends detected by this method are often retrospective and may provide insufficient data to forestall major and perhaps irreversible changes in the fish community. This alternative will result in limited abilities to determine effectiveness and feasibility of future lake trout management alternatives.

b. Past and Present Relevant Actions

FWP has developed a database of historic netting and invertebrate sampling information. This information will be valuable in interpreting changes in the Swan Lake aquatic community through time.

c. Reasonably Foreseeable Relevant Actions Not Part of the Proposed Action

The lake trout population in Swan Lake will continue to grow, thereby competing with and predating on native bull trout and the recreationally important kokanee salmon and northern pike populations. Through time, anglers will lose the ability to fish for bull trout, and opportunities for kokanee fishing will be diminished. It is also likely that as the fish community is altered, the loss of kokanee forage will reduce the growth rate of lake trout and bull trout and minimize the ultimate numbers of trophy-sized fish of both species. Due to these changes, it is anticipated public demand for active management of the lake trout population will eventually increase as the growth rates and sizes of the lake trout inevitably will decrease.

2. Alternative B: Continued Removal of Subadult and Adult Lake Trout – Proposed Action

An extension of removal efforts aimed at both subadult and adult lake trout in Swan Lake will provide information necessary to determine the efficiency and potential success of a lake trout removal program. Research efforts from 2009-2011 determined that gill nets can be an effective

tool to affect year to year lake trout cohort strength; however, the overall effect these efforts had on the lake trout population remains unknown. An extension of removal efforts would allow for these analyses to be completed. Additionally, reducing lake trout numbers will delay effects to kokanee and bull trout associated with lake trout predation and competition. Removal of the subadult lake trout using large-scale netting operations will reduce the number of lake trout that attain both the size in which they prey upon kokanee and bull trout and the age in which they reach sexual maturity. Efforts aimed at the adult, spawning population of lake trout will directly reduce lake trout recruitment by removing mature fish before and during egg deposition. Measurable goals and specific success criteria defined in the 2009 EA will be used to evaluate the efficacy of these actions and will continue to be assessed on an annual basis. Through this evaluation process, methods may be adjusted to improve efficiency, and plans for future management may be developed. Some lake trout control projects in the Western United States have failed to establish solid baseline information; thus, the programs have struggled to show progress, and in some cases it is unknown what level of effort is required to achieve the desired lake trout population levels. Baseline population information for Swan Lake has been recorded to date and will continue to be collected as the project progresses. This will allow scientists to determine appropriate levels of needed effort and future costs associated with containment of lake trout expansion in Swan Lake and the Swan River drainage.

a. Principal Actions of Alternative B

The principal actions involved in this multifaceted removal approach are: to enlist the services of professional fishery consultants and their equipment, conduct juvenile/subadult gill netting over a three-week period (late August-September), conduct gillnetting over spawning lake trout (late September-October), cull collected lake trout, record biological information (size, aging structures, genetic samples, etc.) from the culled lake trout, field dress salvageable culled lake trout, and distribute them to the public for consumption through food banks. Based on previous netting efforts, we anticipate an annual removal of 5,000 to 10,000 lake trout per year in Swan Lake under Alternative B, with the potential for diminishing numbers in out years if the project succeeds.

b. Mitigation and Monitoring

Bull trout and other fish species bycatch mortality will be mitigated by using short-duration gill net sets, netting during periods when spawning bull trout are out of the lake in upstream spawning areas, only sampling deep water habitat (>60’), avoiding areas with known high catch rates of bull trout while maximizing lake trout catch, and through the use of an oxygen-supplied fish recovery system. Bull trout population monitoring (annual redd counts, juvenile population estimates, and trend netting) in addition to aquatic community monitoring (fish and invertebrates) will be continued to evaluate the effects of the lake trout population on the aquatic community, the effects of bycatch mortality on other fish species, and to provide information to evaluate the effectiveness of control operations.

c. Evaluation Criteria

Defining the success of this project can be difficult. Currently, eradication of the lake trout population in the Swan drainage is not feasible, given existing control methods available. Lake trout may also be established in Lindbergh Lake in the head of the drainage. However, removing a significant portion of the lake trout population annually may help maintain a relatively low lake trout density and would likely result in reduced impacts to the bull trout and kokanee populations. The goal of this lake trout population control experiment is to assess the efficacy of

management actions to reduce the density of lake trout to a point in which rapid population expansion is not occurring and negative effects on populations of kokanee and bull trout are minimized. During the 2009 EA process specific success criteria were established to determine the relative effectiveness of this project. These criteria will continue to be used in the proposed extension of these efforts. These evaluation criteria include the following:

1. Fisheries literature suggests that total annual mortality in excess of 50% has led to the collapse of lake trout fisheries in other regions. However, there is uncertainty, under circumstances for optimal population growth such as Swan Lake currently provides, whether an overfished lake trout population will collapse. Using this as a guideline, we propose to exert a level of effort that would result in at least 50% total annual mortality on both the subadult and adult components of the Swan Lake lake trout population. Cohort analysis from research efforts conducted since 2009 suggest that mortality rates from gillnetting alone are in excess of 50%. A similar amount of effort would be expended in the proposed extension. Additionally, netting aimed directly at the adult component of the population will be similarly evaluated through catch analyses. Models used to determine the gillnetting mortality rate of adult lake trout will improve with regard to accuracy as more years of data are provided. Success of this portion of the netting will also require removal of at least 50% of the adult fish.
2. Determining whether the 50% annual mortality is sufficient to lead to a collapse of the lake trout population will be an important facet of this project. The intent of this level of effort is to reduce the lake trout population to a point in which negative effects to bull trout and kokanee are minimized. Therefore, trend data associated with the lake trout population will be assessed through several metrics. Lake trout catch per unit effort (CPUE) during both the juvenile/subadult netting, as well as the focused spawner netting, will be monitored annually. Additionally, lake trout relative weights and average length of spawning fish will also be monitored to detect changes associated with our actions. If our efforts are successful, lake trout CPUE should decline. Relative weights of lake trout should also remain stable or increase and average length of spawning fish should decrease – other indicators signifying a reduction in larger, older fish. Lake-wide population estimates will be conducted annually to determine if the removal target translates into a significant reduction in lake trout abundance.
3. Maintaining stable and viable populations of bull trout and kokanee is the ultimate goal for this project. Therefore, detecting trends in both the fish populations and the forage base they depend on will also determine the effectiveness of our actions. Bull trout will continue to be monitored through annual redd counts, juvenile estimates in index spawning tributaries, and through CPUE of both routine spring gill-net samples, as well as during the juvenile/subadult netting conducted by professional fisheries consultants. Kokanee numbers will continue to be monitored through annual redd counts, which have been conducted since 1987, as well as through CPUE in routine spring gill-net sampling. Mysis shrimp represent a considerable forage base for juvenile bull and lake trout and, to a lesser degree, provide forage for kokanee. Mysis densities have been monitored in Swan Lake since 1983 and will continue to be collected at standardized times and locations. The proposed extension of the removal efforts will provide increased years of data necessary to evaluate the response of bull trout and kokanee. The removal of over 20,000 lake trout since 2009 will likely decrease predation effects on the two aforementioned fish species. Because of the lag time associated with maturation and how bull trout abundance is monitored (redd counts), a response would not be realized until at

least three years from when lake trout removal was initiated. The additional time period of this project may be sufficient to detect increases in both kokanee and bull trout redd numbers; however, substantial declines could be an indicator that lake trout removal efforts are not effective enough.

Detecting changes in any one of the three aforementioned evaluation criteria may or may not provide conclusive evidence with regard to our removal efforts. However, the suite of indices together may indicate if our efforts have been successful or not. Evaluation criteria Nos. 1 and 2 were thoroughly examined using data from the previous three years of work. However, additional data would increase confidence in all of those metrics. Evaluation criteria No. 3 represents the highest priority for the proposed continuation of removal efforts in determining the feasibility of suppressing lake trout to improve survival of kokanee and bull trout. A positive response in the bull trout and kokanee populations would indicate that lake trout removal efforts have been effective. Additional years of data related to lake trout removal will allow scientists and managers to be better informed to make decisions on the efficacy and feasibility of controlling lake trout populations in Swan Lake with gill nets and the resulting benefits to other fish species. However, it should be noted that a continuation of these efforts would be dependent upon successful acquisition of long-term funding.

d. Past and Present Relevant Actions

FWP has developed a database of historic netting information. This information will be valuable in interpreting changes in the Swan Lake fish community through time. Additionally, results from the previous three years of lake trout removal will be used to evaluate the overall effect our actions have on the lake trout population.

C. Process Used to Develop the Alternatives

1. History and Development Process of Alternatives

A limited number of possibilities exist to remove undesirable fish species in lake environments. These techniques include, but are not limited to: mechanical removal (i.e., netting, manipulating water levels, electrofishing, etc.), chemical treatment, angling harvest, and biological control (examples include the use of predatory fish). These techniques all have benefits and drawbacks, and must be selected on a case-by-case basis for specific water bodies.

2. Alternatives Eliminated from Detailed Study

Fish removal projects utilizing fish toxicants have been conducted extensively in the western United States. These approaches have proven successful in many cases. However, given the robust population of bull trout existing in Swan Lake, this alternative is not feasible or prudent at this time. Similarly, the use of biological controls, such as the introduction of predatory fish, is not being considered because of the unknown consequences to bull trout and other native fish species occupying Swan Lake.

D. Summary of Comparison of the Activities, the Predicted Achievement of the Project Objectives, and the Predicted Environmental Effects of All Alternatives

1. Summary Comparison of Project Activities

Comparisons of the project activities under the two alternatives are to simply extend the current multifaceted removal of lake trout (Alternative B) or do not remove lake trout (Alternative A).

2. Summary Comparison of Predicted Achievement of Project Objectives

The primary objective of this project is to assess the efficacy of removing lake trout from Swan Lake to minimize the potential impacts to the kokanee and bull trout populations. The no-action alternative will not satisfy this objective. This will limit the ability to determine the feasibility and efficacy of lake trout control options and will not result in a reduction of lake trout in Swan Lake. Under Alternative A the lake trout will continue to expand and establish, but under Alternative B, removing many lake trout from the population may minimize the impacts of lake trout to the existing aquatic community. Alternative B may also allow more time to identify and evaluate additional actions to manage the lake trout population.

3. Summary Comparison of Predicted Environmental Effects

FWP predicts that Alternative A will not have any direct or immediate environmental effects. However, Alternative A may have significant long-term environmental consequences (e.g., reduction in bull trout and other species, loss of angling opportunities, potential loss of forage for fish-eating birds and other wildlife) and indirect effects in not providing the information needed to evaluate the effectiveness and feasibility of control actions.

FWP predicts that Alternative B will have direct and immediate environmental effects in the Swan Lake aquatic ecosystem. Alternative B will remove many lake trout from Swan Lake, possibly minimizing the impact (in the short term) of those lake trout on the aquatic community. In addition, Alternative B will provide information for determining the feasibility and efficacy of long-term lake trout population control options. Alternative B will also have direct impacts on the bull trout population in Swan Lake through bycatch mortality. However, this mortality may be partially mitigated by using short duration gill net sets, rapidly resuscitating and releasing live fish, netting during periods when spawning bull trout are out of the lake in spawning areas, and avoiding areas and depths with known high catch rates of bull trout. Estimated bull trout bycatch mortality from efforts since 2009 has been approximately 150-175 fish per year, roughly 40% of inadvertently captured fish. Fishing effort for this extension of the lake trout removal project is anticipated to be similar to the 2009-2011 work. This amount of effort, coupled with an increased knowledge of likely bycatch locations, should result in similar numbers of direct mortality to bull trout. A thorough analysis of the potential impacts to bull trout associated with bycatch mortality can be found in the summary report for the previous three years of work (Rosenthal et al. 2012).

Other fish species will be directly affected through bycatch mortality. However, based on the previous three years of netting, the number of species and number of fish killed will be low. The following table summarizes overall catch by species for research netting efforts from 2009-2011 and also demonstrates the selectivity of the gear for lake trout. Mortality for most other species was not determined; however, typically 60% of the bull trout captured were released successfully.

Fish Species	2009	2010	2011
Lake trout	5,452	10,428	5,450
Bull trout	264	299	341
Kokanee	228	524	205
Mountain whitefish	107	33	33
Pygmy whitefish	139	63	9
Longnose sucker	136	355	210
Northern pikeminnow	63	150	162
Largescale sucker	58	109	111
Rainbow trout	9	15	18
Northern pike	2	0	7

3.0 Affected Environment

A. Introduction

Chapter 3, Affected Environment, identifies and describes those resources that are affected by the proposed action and is organized by general resource categories and their associated issues. It does not describe any effects of the alternatives, as these will be covered in Chapter 4. The descriptions of the existing environment found in this chapter can be used as a baseline for comparison in Chapter 4.

1. General Description and Location of Swan Lake

Swan Lake (3,239 acres) is located in the Swan River Valley of northwest Montana. The Swan drainage forms a major tributary to Flathead Lake. Swan Lake recently contained one of the strongest bull trout populations in the entire Columbia River Basin.

B. Description of Relevant Affected Resources

1. Issue 1 - Fish Species

A variety of native and nonnative fish species are present in Swan Lake and its tributaries. Bull trout, westslope cutthroat trout, mountain whitefish, pygmy whitefish, sculpin, northern pikeminnow, peamouth, longnose sucker, and largescale sucker comprise the native fish species in the basin. Nonnative fish species present in the system are lake trout, rainbow trout, kokanee salmon, brook trout, northern pike, yellow perch, brook stickleback, central mudminnow, and pumpkinseed. Swan Lake bull trout populations have long been one of the most robust populations remaining in the historic distribution in the United States. Due to the historic strength and stability of the Swan Lake bull trout population, the opportunity for anglers to harvest bull trout in Swan Lake was maintained until 2012. Because bull trout redd count numbers have declined in recent years, FWP implemented a regulation change starting March 1, 2012, allowing only catch-and-release fishing for bull trout. A substantial fishery exists in Swan Lake for kokanee salmon. In fact, creel surveys conducted in 1984, 1995, and 2010 indicated that kokanee salmon were the most targeted fish species, followed by northern pike, and bull trout. Over the past ten years, angler effort on Swan Lake has varied from 6,262(±1,221) to 10,424(±2,005) angler days. The presence of many nonnative fish poses threats to native fisheries. Aside from competing with native salmonids, brook trout hybridize with bull trout. Brook trout also directly predate on some native salmonids. Lake trout threaten native salmonid populations through competition and predation, and are considered by fisheries biologists as the greatest threat to bull trout and kokanee in Swan Lake.

2. Issue 2 - Threatened and Endangered Species

Bull trout, a threatened species under the Endangered Species Act, are present in Swan Lake and associated tributaries. Bull trout in the Swan Lake basin primarily exhibit an adfluvial life-history strategy. Under this life-history strategy, adult bull trout reside primarily in Swan Lake. Adult bull trout utilize Swan River tributaries for spawning, which occurs in September and October. Juvenile bull trout typically rear for two or more years in Swan River tributaries before migrating to Swan Lake to mature. Thus, at any given time the bull trout population in Swan Lake is comprised mostly of non-spawning adults and subadult fish. Spawning adults move seasonally in and out of the lake environment.

3. Issue 3 - Sensitive Species

Westslope cutthroat trout are a sensitive species that are present in Swan Lake. Historically, westslope cutthroat trout were the only other trout species present (other than bull trout) in the Swan drainage. The establishment of rainbow trout and brook trout throughout the Swan drainage has impacted westslope cutthroat trout. Rainbow trout readily hybridize with westslope cutthroat trout. Since 1975, FWP has stocked hatchery westslope cutthroat trout into Swan Lake. However, due to the current lake trout situation and low rates of return, that stocking program was suspended starting in 2008. Although no genetic data are available, hybridized westslope cutthroat trout and rainbow trout are likely present in Swan Lake. Brook trout established throughout the Swan drainage compete with and predate on westslope cutthroat trout.

4. Issue 4 - Public Controversy

Nonnative fisheries impacts on native fisheries and fish removal projects often generate public controversy. Typically, public controversy related to fish removal projects centers around the use of fish toxicants, which is not the strategy in the proposed project. A growing segment of the public want to see the impacts of nonnative fish on native fish communities mitigated to prevent declines and extirpation of native species. To date, this has been the case with lake trout in Swan Lake. On the other side of the issue, anglers often resist nonnative removal programs due to the fact that they enjoy angling for the targeted species. Trophy lake trout are in demand, but other lake trout fishing alternatives exist in the Flathead Valley. Overall, the potential exists for public controversy over decisions of this EA and future actions to manage lake trout in Swan Lake, but based on the previous EA and from press highlighting this project, little controversy has surfaced.

4.0 Environmental Consequences

A. Introduction

Chapter 4 describes the environmental effects of each alternative on the resources described in Chapter 3 and contains scientific and analytic basis for the alternatives comparison summarized in Chapter 2. It is organized in the same manner as Chapter 3 by general resource categories and their associated issues.

B. Predicted Attainment of the Project Objective for all Alternatives

1. Predicted Attainment of the Project Objective

a. Alternative A: No Action

The no-action alternative will not satisfy the objective of assessing the efficacy of reducing the lake trout population in Swan Lake to benefit other fish species. In addition, information regarding the feasibility and efficacy of lake trout population control methods will not be obtained. Information gained from the 2009-2011 removal efforts suggested that the current level of gillnetting effort was sufficient to affect year-to-year lake trout cohort strength. However, the overall effect these efforts had on the lake trout population remains unknown. Without an extension of the project, data to determine this overall impact will not be acquired. The lack of this information makes identifying future control alternatives and evaluating their success difficult, if not impossible.

b. Alternative B: Continued Removal of Subadult and Adult Lake Trout

An extension of the multifaceted removal of lake trout in Swan Lake will provide information on the feasibility and efficacy of management options for the recently established population of lake trout. This information will be invaluable in identifying potential control alternatives. Concomitant with this information, Alternative B will also result in a reduction of lake trout numbers in Swan Lake. The proposed project will likely result in 5,000-10,000 lake trout being removed annually. If the project reduces lake trout recruitment, numbers of lake trout removed will likely diminish with the decreasing population in out-years (assuming constant effort).

C. Predicted Effects on Relevant Affected Resources of All Alternatives

1. Predicted Effects on Fish Species (Issue 1)

a. Effects of Alternative A: No Action on Issue 1 - Fish Species

- Direct Effects - The no-action alternative would not have any direct or immediate effects on fish and wildlife, given that no action would take place.
- Indirect Effects - The no-action alternative would have indirect effects on the fish community in Swan Lake. If no action is taken, data required to identify lake trout control options and evaluate their feasibility and effectiveness will not be obtained. Further, the no-action alternative will not result in additional removal of lake trout from Swan Lake. By not removing lake trout from Swan Lake, lake trout will likely further expand, thereby making future options for coping with the lake trout population expansion or restoring lost species complexes less effective. Not taking advantage of the early stage of the lake trout population establishment in Swan Lake may ultimately have significant negative consequences for bull trout and kokanee salmon fisheries in Swan Lake and associated waters upstream and downstream. There is some concern that changes in the fish community may already be underway.

- Cumulative Effects - The indirect effects of Alternative A on the fish community in Swan Lake may cause cumulative and indirect effects on the wildlife community. Fish available to be eaten by eagles, loons, ospreys, mink, otters, and other wildlife may be reduced. Fish species that are surface-oriented or which may spawn upstream in the Swan River, thus making them more available to predators (e.g., kokanee, mountain whitefish, cutthroat, and bull trout), will be partially or completely replaced by the more benthic-oriented and non-migratory, lake-dwelling lake trout that are largely unavailable to terrestrial predators.

b. Effects of Alternative B: Continued Removal of Subadult and Adult Lake Trout on Issue 1 - Fish Species

- Direct Effects - An extension of the multifaceted removal of lake trout in Swan Lake will directly reduce the lake trout population. Incidental bycatch mortality will also directly affect other fish species that reside in Swan Lake.
- Indirect Effects - Reducing the lake trout population in Swan Lake will have indirect effects on the remaining aquatic community in Swan Lake. A reduced population of lake trout will likely minimize negative impacts to bull trout, kokanee salmon, and other aquatic organisms in Swan Lake and potentially in connected waters upstream and downstream.
- Cumulative Effects - Netting aimed at reducing the lake trout population in Swan Lake may have cumulative effects on bull trout through incidental bycatch occurring annually. A more complete analysis of this potential impact can be found in the summary report for the work conducted from 2009-2011.

2. Predicted Effects on Threatened and Endangered Species (Issue 2)

a. Effects of Alternative A: No Action on Issue 2 - Threatened and Endangered Species

- Direct Effects - The no-action alternative will not have direct impacts on threatened or endangered species, as no action will take place.
- Indirect Effects - The no-action alternative will have indirect effects on threatened and endangered species. Specifically, not obtaining adequate information to evaluate control options for the lake trout population will limit the ability to manage lake trout and bull trout. Therefore, there is a high likelihood bull trout will be affected through predation and competition with lake trout. In addition, the no-action alternative will not result in a reduction in the lake trout population. By not reducing the number of lake trout, the population may further expand, thereby limiting control options and the efficacy of future alternatives. If the lake trout population becomes more established, the interactions (competition and predation) between bull trout and lake trout will increase, which will negatively affect the bull trout population.
- Cumulative Effects - If the no-action alternative is chosen, continued expansion of lake trout in Swan Lake could be expected. As this occurs, lake trout may spread throughout the system, having similar negative impacts on the Swan River system and Holland and Lindbergh Lakes. Lake trout have already been detected in Lindbergh Lake. All of these water bodies contain important bull trout populations. Cumulative impacts to bull trout throughout the Swan River Basin may further threaten this native species. Lake trout have also been documented moving downstream into Flathead Lake. Increases in this downstream migration of lake trout could confound native species management issues in that water body.

b. Effects of Alternative B: Continued Removal of Subadult and Adult Lake Trout on Issue 2 -Threatened and Endangered Species

- Direct Effects - An extension of the multifaceted removal of lake trout in Swan Lake will directly affect bull trout, a threatened species under the Endangered Species Act, through bycatch mortality. Estimated mortality for bull trout will likely be similar to netting efforts conducted from 2009-2011. Conducting short-term gill net sets, avoiding areas with high bull trout catch rates, and careful handling and release of collected live bull trout would help mitigate mortality of bull trout. The USFWS will provide coverage for incidental take of bull trout through Section 6 of the Endangered Species Act.
- Indirect Effects - An extension of the multifaceted removal of lake trout in Swan Lake will likely have positive indirect effects on bull trout. Based on previous netting efforts, an estimated 5,000 to 10,000 lake trout will be removed annually from Swan Lake. This will reduce the impacts of lake trout (predation and competition) on bull trout.
- Cumulative Effects - Netting aimed at reducing the lake trout population in Swan Lake may have cumulative effects on bull trout through incidental bycatch occurring annually. A more complete analysis of this potential impact can be found in the summary report for the work conducted from 2009-2011.

3. Predicted Effects on Sensitive Species (Issue 3)

a. Effects of Alternative A: No Action on Issue 3 - Sensitive Species, Westslope Cutthroat Trout

- Direct Effects - None.
- Indirect Effects - Selecting the no-action alternative will not result in an immediate reduction of the lake trout population in Swan Lake. As a result, lake trout predation rates on westslope cutthroat trout will not be reduced and will begin to increase as new cohorts of lake trout are produced. The westslope cutthroat trout stocking program has already been eliminated and further negative effects on angler opportunity to catch westslope cutthroat trout can be anticipated in the lake and the Swan River.
- Cumulative Effects - None.

b. Effects of Alternative B: Continued Removal of Subadult and Adult Lake Trout on Issue 3 - Sensitive Species, Westslope Cutthroat Trout

- Direct Effects - An extension of the multifaceted removal of lake trout in Swan Lake may have direct effects on westslope cutthroat trout through bycatch mortality; however, it is likely that any bycatch mortality would be extremely low (<10 fish). Netting efforts from 2009-2011 did not capture any westslope cutthroat trout.
- Indirect Effects - An extension of the multifaceted removal of lake trout in Swan Lake will cause a direct reduction in the lake trout population, thereby indirectly reducing predation from lake trout on westslope cutthroat trout.
- Cumulative Effects - None.

4. Predicted Effects on Public Controversy (Issue 4)

a. Effects of Alternative A: No Action on Issue 4 - Public Controversy

- Direct Effects - The no-action alternative may have direct effects on public controversy by not satisfying the objective of the project, raising concern from public groups that FWP is not addressing the expanding lake trout population impacts to bull trout.

- Indirect Effects - Indirectly, the no-action alternative may lead to public controversy if lake trout numbers are not reduced and lake trout continue to cause population level effects on kokanee salmon and bull trout populations (among other fish species and invertebrates). Reductions in kokanee salmon and bull trout populations will indirectly affect established and traditional angling opportunities.
- Cumulative Effects - The no-action alternative is likely to affect characteristics of the fishery in the Swan River system as fish community changes occur, reducing angling opportunity for bull trout and kokanee salmon, which may concern some anglers. Continued expansion of lake trout in the Swan Lake system may eventually lead to the establishment of lake trout in Lindbergh and Holland Lakes and expansion in the Swan River system. Lake trout have already been detected in Lindbergh Lake, reinforcing this notion.

b. Effects of Alternative B: Continued Removal of Subadult and Adult Lake Trout on Issue 4 - Public Controversy

- Direct Effects - A large netting effort of lake trout in Swan Lake may directly cause public controversy over the removal of lake trout. However, because of the early stage of lake trout establishment, a recreational lake trout fishery has yet to materialize. Fish removal projects have in the past caused public controversy, mainly over the use of fish toxicants; however, fish toxicants are not being used under any alternative in Swan Lake. Misinformation on this project will be minimized through educational opportunities and public meetings.
- Indirect Effects - Some anglers may be temporarily disrupted, precluded from fishing in certain locations, or disturbed by sampling activities. However, because of the timing of this project (late summer, with activities conducted mostly in predawn or postdarkness hours) and the short duration, such effects will be minimal. A reduction in lake trout will reduce the formation of a lake trout fishery, which may concern some anglers.
- Cumulative Effects - None.

D. Relationship of Short-term Uses and Long-term Productivity (on all resources)

1. No-Action Alternative

Under the no-action alternative, the short-term ability to effectively identify and evaluate control options for the lake trout population in Swan Lake will be considerably reduced, if not completely lost. In a long-term perspective, because the no-action alternative will not result in a reduction of lake trout numbers, the ability to address the lake trout population at an early stage of establishment may be lost. If the larger cohorts of young lake trout reach sexual maturity, the population may exhibit an exponential growth phase, after which growth and condition of lake trout (and perhaps other species such as bull trout) are likely to decline and the feasibility of control measures are severely reduced. This course of events will likely result in loss of the existing multispecies fishery and will dramatically increase the difficulty of reestablishing it.

2. Continued Removal of Subadult and Adult Lake Trout

Under the multifaceted removal alternative, the objectives of the project will be satisfied. First and foremost, adequate information will be obtained to further evaluate control options for lake trout in Swan Lake. Based on other lake trout control projects in the West, this information will be invaluable. Secondly, this removal effort will have an immediate impact on the size of the lake trout population, further reducing it by an estimated 5,000 to 10,000 fish annually. This may

have significant long-term benefits by preventing the lake trout from reaching a point of exponential population growth, where the feasibility of population control is reduced. It is unlikely that complete lake trout removal from Swan Lake can ever be accomplished; however, a considerable reduction in their abundance may be maintained with reduced netting effort in the future.

E. Any Other Disclosures

Although other nonnative species currently exist in Swan Lake (e.g., northern pike), FWP and partners have no intention to pursue removal of these species, as they do not present the same immediate threats to bull trout and kokanee populations and have coexisted for several decades. Furthermore, previous sampling efforts have shown that other species are not selected by deepwater gill netting.

5.0 Identification, Rationale, and Recommendation for Preferred Project Alternative

A. Introduction

In this chapter, the preferred project alternative is identified and recommended with the supporting rationale.

B. Identification and Rationale for Preferred Alternative

1. Preferred Alternative

The preferred alternative is the continued removal of subadult and adult lake trout, Alternative B.

2. Support Rationale

a. Environmental Protection Rationale

Although the preferred alternative will cause some direct impacts to bull trout, minimal numbers of westslope cutthroat trout, and other fish species through bycatch mortality, and may result in public concern, it will immediately reduce lake trout predation of bull trout and kokanee and will provide for identification and evaluation of long-term management approaches for lake trout in Swan Lake. Developing capability to effectively control the lake trout population in Swan Lake may mitigate future lake trout impacts on these same species and issues. It may also reduce the chances that lake trout will spread upstream into Holland Lake as well as migrate downstream into Flathead Lake. Based on situations similar to Swan Lake, if lake trout are not effectively controlled, the impacts to native species and important sport fisheries may be severe.

b. Project Objectives Rationale

The preferred alternative will satisfy the objectives identified.

C. Monitoring Commitments

FWP will continue monitoring fish populations in Swan Lake using standard procedures and equipment. Additionally, FWP will continue to monitor the establishment of lake trout in Lindbergh Lake and other waters upstream of Swan Lake.

6.0 Public Participation

The public will be notified in the following ways to comment on the draft EA for the Extension of Lake Trout Removal Efforts in Swan Lake:

- Legal notices will be published in the Kalispell Daily Inter Lake, the Seeley/Swan Pathfinder, the Bigfork Eagle, the Missoulian, the Lake County Leader, and Helena Independent Record. News releases will be given to the same newspapers and other media outlets.
- Legal notice and the draft EA will be posted on the FWP web site: http://fwp.mt.gov/publications.
- Draft EAs will be available at the FWP Region 1 Headquarters in Kalispell and the FWP State Headquarters in Helena.

This level of public involvement is appropriate for a project of this scale.

The following is a list of agencies consulted in preparation of this EA:

- U.S. Fish and Wildlife Service, Montana Field Office, Creston
- Montana Fish, Wildlife & Parks, Fish and Wildlife Division, Kalispell and Helena
- U.S. Forest Service, Flathead National Forest

Duration of comment period, if any:
The public comment period will be through June 15, 2012. Comments may be e-mailed to lrosenthal@mt.gov or written comments may be sent to the following address:

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7.0 List of Individuals Associated With the Project

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Rebecca Cooper, FWP MEPA Coordinator, Helena
Legal Division, FWP, Helena

8.0 References

Cox, B.S. 2010. Assessment of an invasive lake trout population in Swan Lake, Montana. Master's thesis. Montana State University, Bozeman.

Rosenthal, L.R., W. Fredenberg, J. Syslo, and C. Guy. 2012. Experimental Removal of Lake Trout in Swan Lake, MT: 3-year Summary Report. Prepared for the Swan Valley Bull Trout Working Group. Kalispell, Montana.